

Title (en)

SURFACE PLASMON POLARITON BAND GAP STRUCTURES

Title (de)

BANDLÜCKEN STRUKTUREN FÜR OBERFLÄCHENPLASMONENPOLARITON

Title (fr)

STRUCTURES A BANDE INTERDITE POUR PLASMONS POLARITONS DE SURFACE

Publication

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Application

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Priority

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- US 24341800 P 20001027

Abstract (en)

[origin: US6782179B2] The present invention provides a method and devices for controlling the propagation of Surface Plasmon Polaritons (SPPs) using Surface Plasmon Polariton Band Gap (SPPBG) regions. The SPPBG regions are regions of one or more interfaces supporting the propagation of SPPs on which SPPs experience a periodic modulation of the dielectric properties of the media into which its electromagnetic field extend. The frequency range of the band gap is determined by the period of the modulation. SPPBG regions prohibit propagation of SPPs having a frequency within its band gap. By forming transmitting regions in the SPPBG regions the present invention provides ultra-compact SPP waveguides. The present invention can be utilised to form compact integrated SPP/optical circuits. Also, the present invention provides cavities supporting standing SPP-waves for field localisation. Such field localisation can provide very high field intensities and can be used in various sensor applications. The devices of the present invention provide a number of advantages over photonic components since SPPs propagates on 2-dimensional interfaces, and only confinement in the plane of propagation is needed. This allows for a very simple production of the devices according to the present invention.

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**G02B 6/12**

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